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EXAMINER
LU, KUEN S

ART UNIT	PAPER NUMBER
2167	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>21 July 2004</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,2,5-16,18-32,34-43 and 45-50</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,2,5-16,18-32,34-43 and 45-50</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892) *

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendments

1. The Action is responsive to the Applicant's Amendments, filed on July 21, 2004.

2. The amendment to the Abstract, filed on July 21, 2004 is noted and considered by the Examiner.

3. In responding to Applicant's Amendments made to the claims where the new issues raised because of new combinations of limitations from dependent claims to all independents, specifically relating to <u>repeating the steps of logging at least one transaction and executing the at least one logged transaction on the second server prior to the step of queuing until a set point met</u> and <u>wherein a time duration of each repeating step is shorter than a preceding repeating step</u>, the Examiner has created this Office Action for Final Rejection (hereafter "the Action") as shown next.

4. As for the Applicant's Remarks on claim rejections, filed on July 21, 2004, has been fully considered by the Examiner, please see discussion in the section *Response to Arguments*, following the Action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 6, 8, 10-16, 19, 21, 23-25, 27-32, 35-38, 40-43 and 46-49 are rejected under 35 U.S.C. 102(b) as anticipated by OraRep (Oracle7 Sever Distributed Systems,

Vol. II: Replicated Data, Release 7.3, February, 1996, Oracle Corporation, hereafter

"OraRep").

As per Claims 1, 13, 27, 40 and 41, OraRep teaches the following:

"migrating a database from a first server to a second server while continuing to provide

transaction service" at Page 2-4, Paragraph "Replicated Data" where synchronous

replication provides multiple copies of the same data at different sites available to users;

"providing transaction service on the first server" at Page 4-33, Paragraph "Propagation

Method" and Figure 4-4 by showing a three sites replication system where site A

serving as the first site for providing transaction service;

"establishing a database copy on the second server" at Page 4-33 where Figure 4-4

shows site B having database copy maintaining synchronously with the database at

master definition site A;

"logging at least one transaction from the first server to create a transaction log" at Page

1-13 where one transaction at the source database is stored in a deferred transaction

queue;

"executing the at least one logged transaction on the second server" at Page 1-13

where the deferred transaction at source database is queued, propagated to and

applied to the destination database;

"queuing at least one transaction request" at Page 4-28, Figure 4-3 where request of

transaction, database replication execution at the remote site, is always queued before

being propagated to the destination site;

"executing the at least one queued transaction request on the second server" at Pages

4-33 and 4-44, Figs. 4-4 and 4-5 where the three sites replicate each other

synchronously or asynchronously, and each site queues requests and execute the

request of deferred propagation to other sites;

"providing transaction service on the second server" at Pages 4-33 and 4-44, Figs. 4-4

and 4-5 where the three replication participating sites are available to users; and

"repeating the steps of logging at least one transaction and executing the at least one

logged transaction on the second server prior to the step of queuing until a set point

met" (See Pages 1-13, 3-16, 4-34,10-2, 10-3 and 10-8, wherein OraRep's deferred

transactions at source database are queued and propagated to the destination

database, the replicated transactions at the second server are repeated queued and

applied when the set point job_queue_interval time is reached. Note the jobs queued

are executed periodically. Once a job execution starts, new jobs will be queued but will

not be executed until the next scheduled time arrives. The replicated site is the site for

the second server. Furthermore, the job queue locks is used to ensure a job is executed

only one session at a time. Before acquiring a job queue lock for running the job, the

execution of the job is locked. The above combined teaching is equivalent to Applicant's

repeating the steps of logging at least one transaction and executing the at least one

logged transaction on the second server prior to the step of queuing until a set point

met); and

"wherein a time duration of each repeating step is shorter than a preceding repeating

step" (See Figs. 1-2, 1-5 and 2-2 wherein OraRep's the transactions at source site are

propagated to the destination sites for execution with a time duration shorter at the

destination site than the preceding repeating step executed at the source site due to

lesser load because of less or no activities initiated at the destination site, as evidenced

by the replicating groups 1:3 at site B versus groups 1:2:3 at site A in Figure 1-2, and

data is one direction distributed from Headquarters to Northern Region in Fig. 2-2).

As per Claim 2, OraRep teaches "providing transaction service on the first server

ceases prior to the step of queuing at least one transaction request" at Page 10-8 where

the jobs queued are executed periodically. Once all jobs executed, the execution will be

suspended until next scheduled time arrives. Furthermore, the job queue locks is used

to ensure a job is executed only one session at a time. Before acquiring a job queue

lock for running the job, the execution of the job is locked.

As per Claims 6 and 19, OraRep teaches "the step of establishing a database copy

on the second server includes transmitting of a database backup from the first server

over a network" at Pages 1-15 and 7-6 by teaching creating backups of symmetric

replication databases over a network architecture.

As per Claims 8 and 21, OraRep teaches "the step of transmitting the transaction log

to the second server over a network" at Page 1-15 where database change at the

source site is queued and transferred to the destination site.

As per Claim 10, OraRep teaches "queuing takes place at the first server" at Pages

4-9 and 4-33, Paragraph "Asynchronous Propagation" where deferred transaction is

queued at the replication participation site A.

As per Claim 11, OraRep teaches "queuing takes place at the second server" at Pages 4-9 and 4-33, Paragraph "Asynchronous Propagation" where deferred transaction is queued at the replication participation site B.

As per Claim 12, OraRep teaches "transmitting an application from the first server to the second server" at Pages 4-35 to 4-38 where DDL changes are replicated among master sites.

As per Claims 14 and 28, OraRep teaches "the server that accesses the source and the server that accesses the target are the same server at Page 4-33 and Fig. 4-5 where the server at site C is the server accessing the source site A and destination site B.

As per Claims 15 and 29, OraRep teaches "the server that accesses the source and the source are discrete" at Page 4-33 and Fig. 4-5 where the server at site C is the server accessing the source site A and the servers at sites A and C are discrete.

As per Claims 16 and 30, OraRep teaches "the server that accesses the target and the target are discrete" at Page 4-33 and Fig. 4-5 where the server at site C is the server accessing the target site B and the servers at sites A and B are discrete. at Pages 4-9 and 4-33, Paragraph "Asynchronous Propagation" where deferred transaction is queued at the replication participation site A.

As per Claim 23, OraRep teaches "queuing takes place at the server that accesses the source" at Pages 4-9 and 4-33, Paragraph "Asynchronous Propagation" where queuing takes place at the server pf Site C access the source site A.

As per Claim 24, OraRep teaches "queuing takes place at the server that accesses the target" at Pages 4-9 and 4-33, Paragraph "Asynchronous Propagation" where queuing takes place at the server pf Site C access the target site B.

As per Claim 25, OraRep teaches "at least one of the server is connected to a network" at Page 1-15 by teaching symmetric replication databases over a network architecture.

As per Claims 31 and 42, OraRep teaches the following:

"a copy module that establishes a database copy on the second server" at Page 4-33 where Figure 4-4 shows site B having database copy maintaining synchronously with the database at master definition site A;

"logging at least one transaction from the first server received since any immediately preceding synchronization to create a transaction log" at Page 1-13 where one transaction at the source database is stored in a deferred transaction queue;

"executing the at least one logged transaction on the second server" at Page 1-13 where the deferred transaction at source database is queued, propagated to and applied to the destination database;

"queues at least one transaction request" at Page 4-28, Figure 4-3 where request of transaction, database replication execution at the remote site, is always queued before being propagated to the destination site; and

"executes the at least one queued transaction request on the second server" at Pages 4-33 and 4-44, Figs. 4-4 and 4-5 where the three sites replicate each other

synchronously or asynchronously, and each site queues requests and execute the request of deferred propagation to other sites.

As per Claims 32 and 43, OraRep teaches "establishes the database copy by transmitting a backup of the database over a network to the second server" at Pages 1-15 and 7-6 by teaching creating backups of symmetric replication databases over a network architecture and at Page 4-33 where Figure 4-4 shows site B having database copy maintaining synchronously with the database at master definition site A.

As per Claims 35 and 46, OraRep teaches "the updating module transmits the transaction log to the second server over a network" at Pages 1-15 where database change at the source site is queued and transferred to the destination site. .

As per Claims 36 and 47, OraRep teaches "the transition module queues the at least one transaction request at the first server" at Pages 4-9 and 4-33, Paragraph "Asynchronous Propagation" where deferred transaction is queued at the replication participation site A.

As per Claims 37 and 48, OraRep teaches "the transition module queues the at least one transaction request at the second server" at Pages 4-9 and 4-33, Paragraph "Asynchronous Propagation" where deferred transaction is queued at the replication participation site B.

As per Claims 38 and 49, OraRep teaches "the transition module is activated after a time duration that the updating module is activated reaches a set point" at Page 12-18 where the interval is the set point in time duration for database system to initiate the execution of deferred transaction at the remote replication site.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 5, 18, 34, 39, 45 and 50 are rejected under 35 U.S.C. 103(a) as being

unpatentable over OraRep (Oracle7 Sever Distributed Systems, Vol. II: Replicated

Data, Release 7.3, February, 1996, Oracle Corporation, hereafter "OraRep"), as applied

to Claims 1-2, 6, 8, 10-16, 19, 21, 23-25, 27-32, 35-38, 40-43 and 46-49, and in view of

Pal et al. (U.S. Patent 6,598079, hereafter "Pal").

As per Claims 5, 18, 34 and 45, OraRep teaches transactions are queued and

propagated based on a preset time interval as previously described in claims 1-2, 6, 8,

10-16, 19, 21, 23-25, 27-32, 35-38, 40-43 and 46-49 rejection.

OraRep does not specifically teach "a number of logged transactions executed during

each repeating step is smaller than a preceding repeating step".

However, Pal further teaches "a number of logged transactions executed during each

repeating step is smaller than a preceding repeating step" by decreasing or increasing

the time interval when a process is invoked next by calculating the number of objects

involved in the process increases or decreases, respectively at col. 6, lines 7-21.

It would have been obvious to one having ordinary skill in the art at the time of the

applicant's invention was made to combine Pal's reference with OraRep's by shortening

intervals between executions of queued deferred remote procedure calls such that the

number of jobs queued would have been decreased steadily to an optimal level

because of a time duration of each repeating step is shorter than a preceding repeating

step, and furthermore, the two references are directed to job queue, resource allocation,

time limit for allocation and time interval of transaction scheduling. The combined

reference would have improved the performance of OraRep's system because of

dynamically adjusted scheduling and job queue interval.

As per Claims 39 and 50, OraRep teaches "the transition module is activated" at

Page 12-18 where the interval is the set point in time duration for database system to

initiate the execution of deferred transaction at the remote replication site.

OraRep does not specifically teach activating the transition module "after a number of

logged transactions reaches a set point".

However, Pal teaches setting a maximum number of objects designated in a memory

partition such that the time interval of a process to be invoked will be decreased when

the maximum number is reached.

It would have been obvious to one having ordinary skill in the art at the time of the

applicant's invention was made to combine Pal's reference with OraRep's by setting

and using a maximum number of deferred transactions queued such that deferred

remote procedure call would have been invoked when the maximum number is reached, instead of when a fixed time interval reached, because by doing so the data replication between definition and master sites would have been more flexible and efficient.

8. Claims 7, 9, 20, 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over OraRep (Oracle7 Sever Distributed Systems, Vol. II: Replicated Data, Release 7.3, February, 1996, Oracle Corporation, hereafter "OraRep"), as applied to Claims 1-2, 6, 8, 10-16, 19, 21, 23-25, 27-32, 35-38, 40-43 and 46-49, and in view of OraAdm (Oracle8i Administrator's Reference, Release 3 for Sun SPARC Solaris, August 2000, ORACLE CORPORATION).

As per Claims 7 and 20, OraRep teaches making database backup copy through a network as described in Item 1.

OraRep does not specifically teach "the network is the Internet".

However, OraAdm teaches the implementation of LDAP where Oracle Internet Directory is installed at Page 4-2.

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention was made to combine Pal's reference with OraRep's by implementing LDAP because by doing so the benefits of internet is available.

As per Claims 9, 22 and 26, OraAdm further teaches "network is internet" at Page 4-2 by LDAP implementation.

9.   The prior art made of record

   A. U.S. Patent   6,598,079

   U. Oracle7 Sever Distributed Systems, Vol. II: Replicated Data, Release 7.3,

       February, 1996, Oracle Corporation

   V. Oracle8i Administrator's Reference, Release 3 for Sun SPARC Solaris,

       August 2000, Oracle Corporation

The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

   B. U.S. Publication   2003/0220935

   C. U.S. Patent   6,304,882

   D. U.S. Patent   5,796,999

Response to Arguments

10. The Applicants' arguments filed on July 21, 2004 have been fully considered but

they are not persuasive, for the Examiner's response, please see discussion below:

a). At Pages 13-14, claims 1, 27, 31 and 40-42, Applicant argued that the neither

OraRep nor Pal reference teaches the limitation "wherein a time duration of each

repeating step is shorter than a preceding repeating step".

   As to the above argument a), the Examiner respectfully disagreed. In the original

non-Final rejection of the claims 4, the Examiner combined the OraRep and Pal

references to suggest the teaching. As described previously, the Action further

revealed the teaching suggests by OraRep and the Examiner further repeats the

statements here: OraRep teaches database replication including the one-way

replication where source site transactions are distributed to a destination site. The

configuration suggests transactions are initiated in the source site and cause heavier

system loading because of the user activities, transaction initiation and communication

to destination. OraRep also teaches a replication from a source to a plurality of

destination sites. This configuration of one to many mapping will also contribute heavier

loading to the source site than a single destination site. By the Applicant stated

argument that a time duration of each repeating step is shorter than a preceding

repeating step because of no user activities in the target system, the Examiner came to

a same or similar conclusion that a time duration of each repeating step is shorter than

a preceding repeating step because of less system loading or no user activities.

 b). At Pages 15 and 17, claims 1, 27, 31 and 40-42, Applicant argued that the Pal

reference teaches time duration of an allocation may be longer or shorter than a prior

allocation.

As to the above argument b), the Examiner fully agreed with the Applicant's this

specific assessment. However, the Pal reference is mainly utilized to provide the

teaching of adjusting time duration based on the number of objects allocated for further

combining with OraRep teaching on a time duration of each repeating step is shorter

than a preceding repeating step. In response to the Applicant's argument that there is

no suggestion to combine the references, the examiner recognizes that obviousness

can only be established by combining or modifying the teachings of the prior art to

produce the claimed invention where there is some teaching, suggestion, or motivation

to do so found either in the references themselves or in the knowledge generally

available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed.

Cir. 1992). In this case, it would have been obvious to one having ordinary skill in the art at the time of the applicant's invention was made to combine Pal's reference with OraRep's by shortening intervals between executions of queued deferred remote procedure calls such that the number of jobs queued would have been decreased steadily to an optimal level because of a time duration of each repeating step is shorter than a preceding repeating step, and furthermore, the two references are directed to job queue, resource allocation, time limit for allocation and time interval of transaction scheduling. The combined reference would have improved the performance of OraRep's system because of dynamically adjusting and shortening scheduling and job queue interval.

c). At Page 16, claims 1, 27, 31 and 40-42, concerning the limitation "repeating the steps of logging at least one transaction and executing the at least one logged transaction on the second server prior to the step of queuing until a set point met", the Applicant argued that the Pal reference teaches time duration of an allocation may be longer or shorter than a prior allocation and OraRep does not concern with database migration.

As to the above argument b), the Examiner respectfully disagreed. The rationale of Pal reference usage was previously explained in the Examiner's response to the above argument item b). As to the limitation itself, please refer to the Action for 35 US 102(b) rejection of the claims. As for OraRep's concerning with database migration, please note OraRep's teaching on database replication is a superset of database migration. As detailed in the 469 pages document, OraRep teaches database copying, migrating data

or structure changes via symmetric replication synchronously or asynchronously, among a wide range of operations for synchronizing data and structure among databases in various configurations.

10. In light of the forgoing arguments, the 35 U.S.C 102 rejection for Claims 1-2, 6, 8, 10-16, 19, 21, 23-25, 27-32, 35-38, 40-43 and 46-49 and 35 U.S.C 103 rejection for Claims 5, 7, 9, 18, 20, 22 and 26, 34, 39, 45 and 50 is hereby sustained.

Conclusion

11. THIS ACTION IS MADE FINAL.

The Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. The prior art made of record, listed on form PTO-892, and not relied upon, if any, is considered pertinent to applicant's disclosure.

If a reference indicated as being mailed on PTO-FORM 892 has not been enclosed

in this action, please contact Lisa Craney whose telephone number is 571-272-3574 for

faster service.

13. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Kuen S Lu whose telephone number is 571-272-4114.

The examiner can normally be reached on 8 AM to 5 PM, Monday through Friday.

If at tempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Breene can be reached on 571-272-4107. The fax phone number for

the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-305-3900.

Kuen S. Lu   Luke Wassum

Patent Examiner   Primary Examiner

November 15, 2004   November 15, 2004